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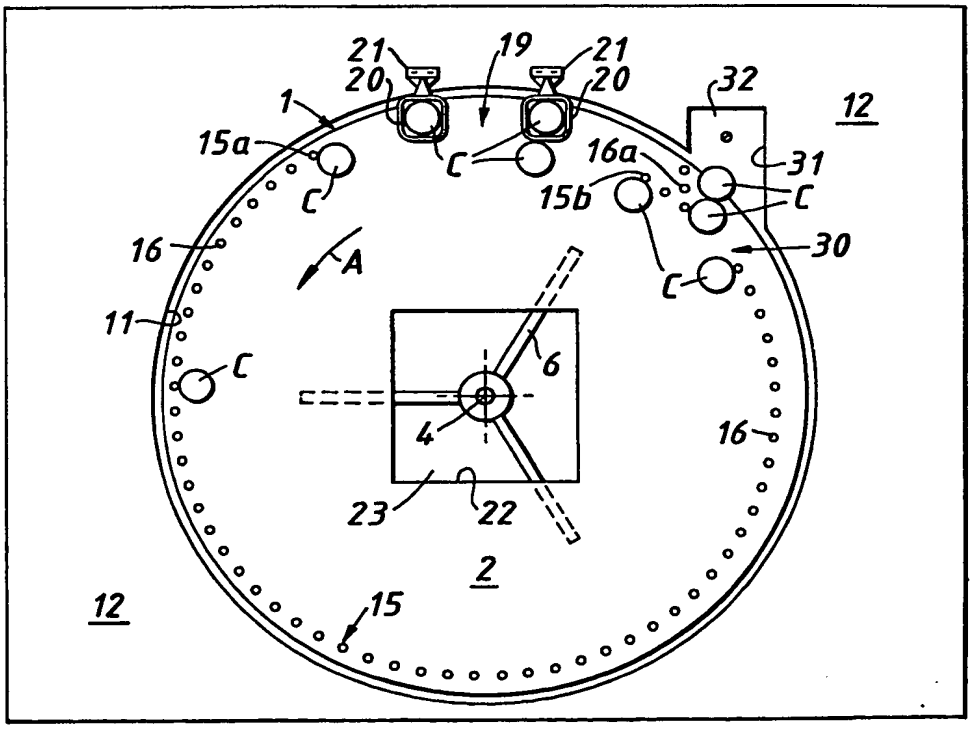
(54) Amusement-with-prizes machine

(57) A game machine for coins or tokens has a rotating flat horizontal playfield 2 which rotates about axis 4 in the direction of arrow A beneath a peripheral wall 15 formed by an array of vertical rods 16. Coins C are delivered to the playfield 2 through chutes 20 to be carried by the playfield into abutment with the end 15a of the wall and thereafter moved in abutment along the wall. The wall 15 is of spiral form with respect of the axis 4 so that the coins moving along the wall are displaced progressively towards the centre of the playfield. An aperture 22 is provided in the playfield and when sufficient coins ar deposited on the playfield and displaced in abutment with each other towards the aperture 22, coins can fall through the aperture for collection as winnings by a player. Located in the wall 15 is an opening 30 through which a proportion of coins on the playfield can pass to move off the playfield and fall through an opening 31 to a collection station inaccessible by th player. Risers can be provided in the playfield surface and adjacent to the aperture 22 to cause stacks of coins to develop and possibly overhang the aperture 22 during their displacement over the playfield.

FIG.1.



At least one drawing originally filed was informal and th print reproduced here is tak n from a later filed formal copy.

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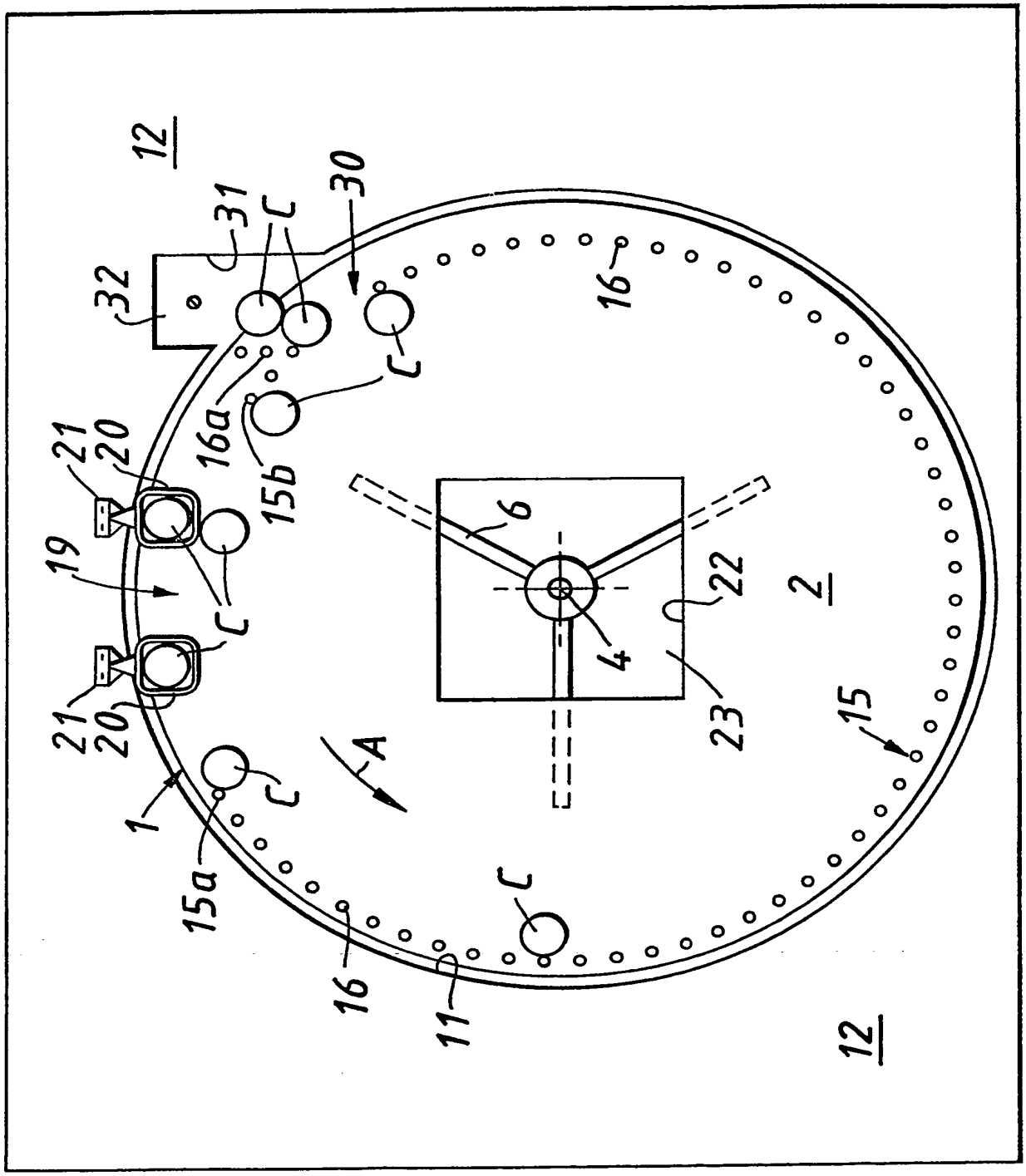

FIG.1.

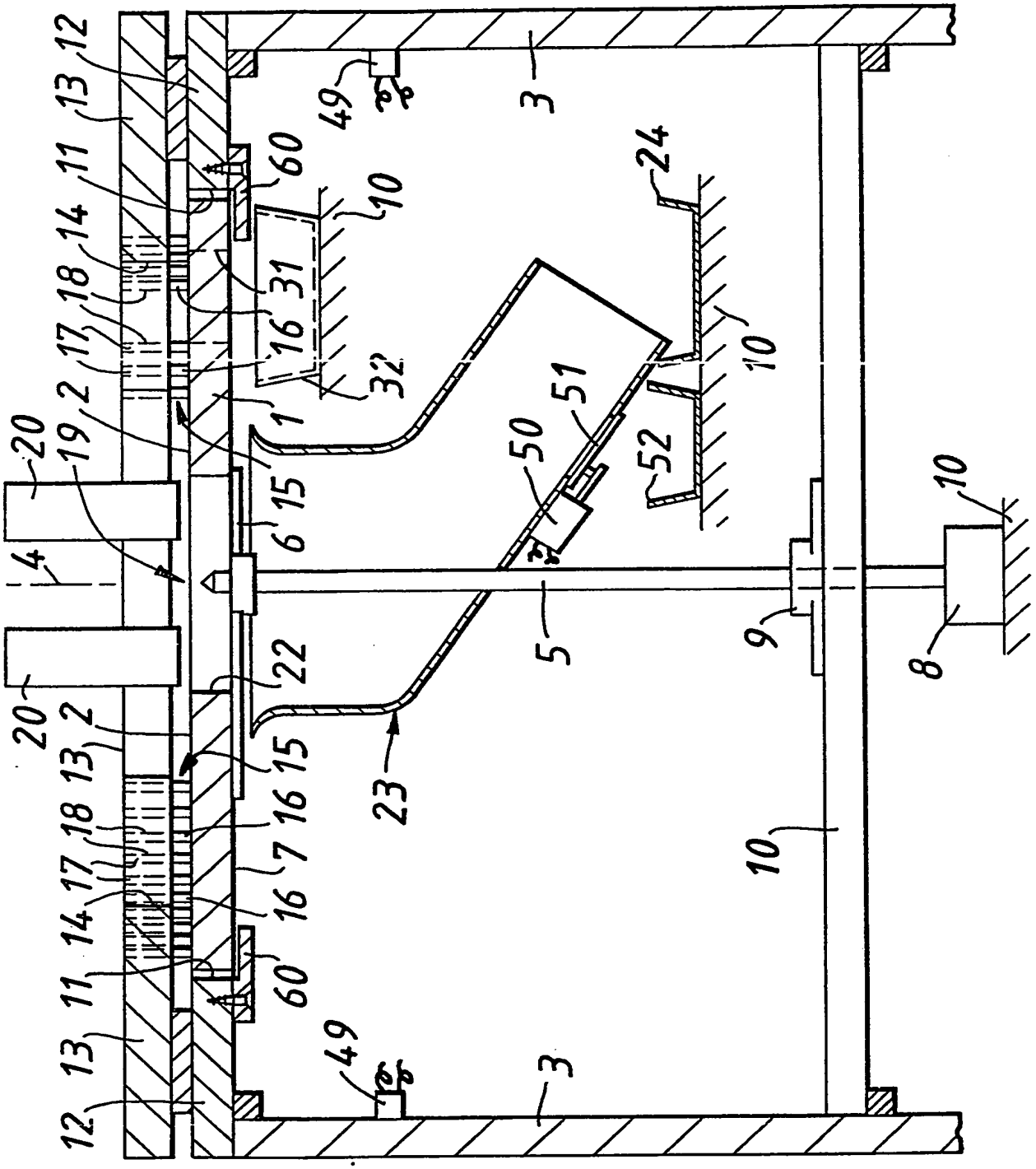

FIG.2.

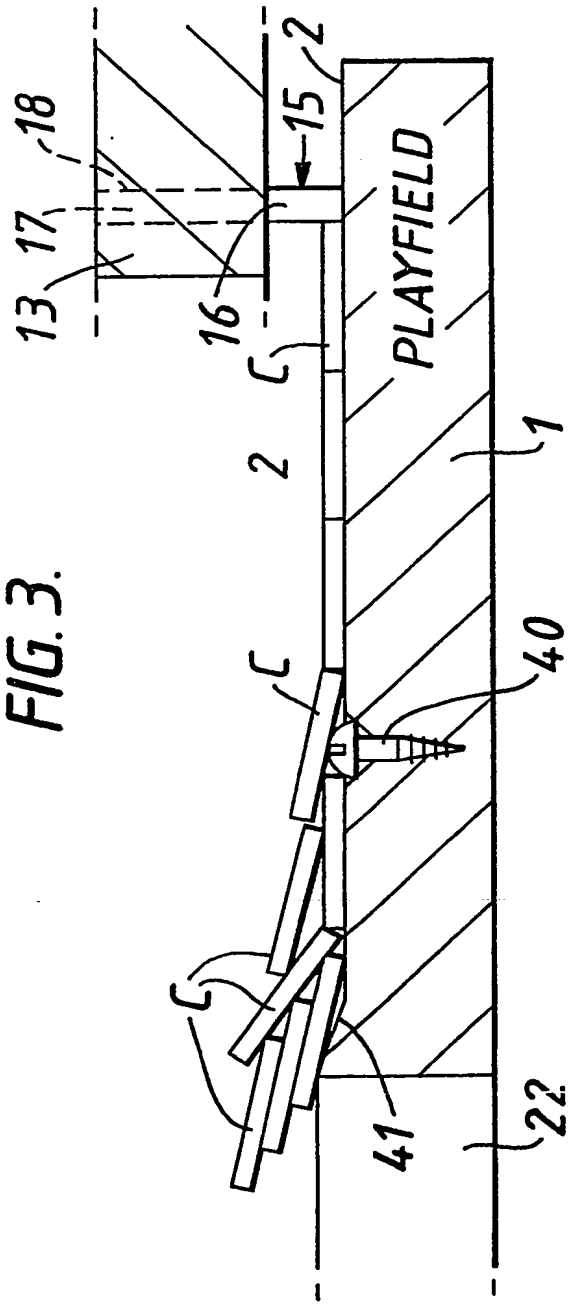

FIG. 3.

TITLE

"A game machine"

TECHNICAL FIELD & BACKGROUND ART

The present invention relates to a game machine and is particularly concerned with a machine into which a player feeds playing pieces such as coins (or similarly flat faced pieces such as tokens which are usually, but not essentially, circular in profile) to play what is generally known in the art as a "pusher game".

A known pusher game machine has a generally flat horizontal playfield with a front edge over which the playfield communicates with a coin collection station. Positioned remotely from the front edge and slidable over the playfield to reciprocate towards and from the front edge is a pusher box onto an upper horizontal surface of which coins fed by a player to the machine are allowed to fall (usually through a coin chute). The pusher box reciprocates beneath a stationary wall which slides over the upper surface of the pusher box to displace coins lying on that upper surface so that they fall therefrom onto the playfield. The reciprocating pusher box subsequently displaces the coins over the playfield towards the front edge. As coins are fed to the machine the number of coins on the playfield progressively increases so that the edges of the coins can abut each other and thereby be moved towards the front edge. Eventually there will be sufficient coins appropriately but randomly disposed on the playfield so that when a further coin falls onto the playfield and is pushed over it by the pusher box it will cause one or more coins to fall from the playfield over the front edge for collection by the player at the collection station - these are known as "winning coins" and may provide the player with a profit on the coin or coins which

that player has fed to the machine. Usually provided in the playfield remote from the front edge are apertures or slots through which some coins can fall (as they are being pushed over the playfield) to pass to a second coin collecting station to which a player is unlikely to have access - coins in the second collecting station are known as "loss coins" and generally provide the proprietor of the machine with a proportion of the coins which are played to cover general expenses and profit. The known game machine as above described is extremely popular in game arcades and the like but it is recognised that there is a need for a new coin pusher game machine to maintain players interest and which can be constructed relatively simply and economically without the requirement for a reciprocating pusher box.

STATEMENT OF INVENTION & ADVANTAGES

According to the present invention there is provided a game machine comprising a substantially horizontal playfield rotatable about a substantially vertical axis and drive means for effecting such rotation; wall means extending along an outer peripheral region of the playfield and relative to which the playfield rotates; means for depositing playing pieces at a deposit region on the playfield so that said playing pieces are carried by the rotating playfield to move along the wall means in abutment therewith; an apertured region in the playfield remote from said wall means and through which playing pieces can fall for collection, and wherein said wall means is arranged to displace playing pieces over the playfield progressively towards said apertured region as playing pieces move along the wall means.

By the present invention it is intended that as playing pieces, such as coins or generally flat faced

tokens similar to coins as previously mentioned, are fed (usually through a chute) onto the rotating playfield at the deposit region, they are carried by the playfield to fall flat and move into abutment with the wall means. As the playfield rotates the playing pieces (which, for convenience, will hereinafter be referred to as "coins") slide along the wall means to be displaced progressively towards the apertured region. It is not intended that a coin which moves in abutment along the wall means should be displaced sufficiently while in contact with the wall means to fall through the apertured region. However, after a coin has been carried on the playfield through one revolution from the deposit region it is intended to be displaced nearer to the apertured region to provide clearance for a successive coin fed onto the playfield at the deposit region. By feeding successive coins to the playfield, a sufficient number of randomly disposed coins will exist on the playfield which can abut each other. Eventually a coin fed to the playfield will cause sufficient displacement of coins already on the playfield for one or more coins to fall through the apertured region for collection - these would be regarded as winning coins with the collection station being accessible by the player.

Such a general arrangement for the machine is extremely convenient and economical for manufacturing purposes as basically the only moving part required is a rotating playfield which can be simply achieved by direct drive from an electric motor.

Preferably the wall means extends around the periphery of the playfield for a length less than that corresponding to one revolution of the playfield. It is also preferred that the length of the wall means is a major part length of the periphery of the playfield. In this latter

arrangement the deposit region may be located at an opening in the peripheral extent of the wall means for coins deposited in said region to be carried by the rotating playfield into abutment with a leading end of the wall means and subsequently displaced in abutment along the wall means until eventually the coin moves off a trailing end of the wall means after having been displaced relatively towards the apertured region from the deposit region and thereby provide clearance for successive coins to fall onto the playfield at the deposit region. Preferably the playing pieces deposited on the playfield at the deposit region are displaced by the wall means towards the apertured region during one revolution of the playfield from the deposit region by an amount not less than that substantially corresponding to the width/diameter of a coin.

To permit sufficient coinage to be accommodated on the playfield to render the machine attractive for a player it is preferred that the playfield has a minimum width from the wall means to the apertured region which corresponds to or can accommodate a plurality of diameters/widths of the coins for which the machine is intended.

The apertured region is preferably a single aperture in the playfield which will usually be located centrally of the playfield. It is appreciated however that the apertured region can comprise two or more apertures in the playfield through any one of which winning coins can fall.

Desirably the wall means extends downwardly to abut the playfield as the latter slides beneath the wall means to alleviate the possibility of coins from passing between the bottom of the wall means and the playfield. Where the wall means abuts the playfield for the latter to slide beneath it, it is preferred that the wall means is mounted

to "float" on the playfield in the sense that the wall means is vertically displaceable in its abutment with the playfield. It is appreciated that within the cost limitations generally imposed in the manufacture of pusher game machines it is unlikely that the peripheral region of the playfield will be truly flat and rotate truly horizontally (particularly when heavily loaded with randomly disposed coins) and a floating wall means can accommodate for undulations in the profile of the playfield and variations in the horizontal disposition of the playfield during its rotation. Conveniently the wall means comprises an array of upstanding pegs, rods or similar components the lower ends of which abut the playfield. Upper part lengths of the pegs or rods can be slidably received in a support member to be capable of exhibiting vertical displacement and provide the wall means with the aforementioned floating characteristics.

Usually the playfield will be provided or communicate with an outlet which is separate from the apertured region and through which outlet a proportion of coins on the playfield can pass during rotation of the playfield for collection at a collecting station (which is separate from such a station at which coins that fall through the apertured region are collected) - coins passing through the aforementioned outlet may be loss coins to which a player of the machine is unlikely to have access. The outlet from the playfield may be located in an opening (or a second opening) in the peripheral extent of the wall means through which a proportion of coins is displaced from the playfield during its rotation. In addition, or alternatively, the outlet can comprise a second apertured region in the playfield remote from the wall means and which is appropriately sized relative to the first

mentioned apertured region to provide appropriate proportioning between loss coins and winning coins.

Usually the playfield will include riser means which can provide an undulation or ramp in the surface of the playfield so that the coins can be displaced onto the riser means and possible ride over each other to develop a stack or pile of coins on the playfield. For example a ramp may be located on a peripheral edge of the playfield which partly or wholly forms the apertured region for winning coins so that a stack of coins can develop to overhang that apertured region to entice a player.

Desirably the game machine includes vibration sensitive means which reacts in response to unauthorised vibration or banging of the machine and responds to divert what are presumed to be winning coins (which fall through the apertured region) from their passage to a first collecting station (to which a player has access) to a second collecting station to which player access is inhibited. Such vibration sensitive means may include a timer to be self setting after a predetermined interval to normally direct winning coins to the first collecting station.

DRAWINGS

One embodiment of a game machine constructed in accordance with the present invention will now be described, by way of example only, with reference to the accompanying illustrative drawings in which:-

Figure 1 is a plan view of the machine in which a mounting for the wall means thereof has been omitted for convenience of illustration;

Figure 2 is a side elevation of the machine in part section, and

Figure 3 shows a modification for the playfield by the

provision of risers for developing coin stacks.

DETAILED DESCRIPTION OF DRAWINGS

The game machine has a circular table 1, a flat upper, horizontal, surface of which forms a playfield 2. The table 1 is housed within a cabinet 3 with its axis 4 vertical and is mounted to be rotatable about its vertical axis by a co-axial drive shaft 5. The table 1 is carried by the shaft 5 and for rotation therewith (in the direction of arrow A in Figure 1) by a spider or bracket 6 having radial legs which are fixedly secured to the shaft and to the underside surface 7 of the table. The shaft 5 is rotatably driven by an electric motor 8 and is supported in bearings 9 in a frame 10 of the cabinet. The table 1 is concentrically received with slight clearance within a circular aperture 11 in a horizontal flange plate 12 of the cabinet. Secured to and carried by the flange plate 12 is a wall mounting plate 13 (see Figure 2) having a circular aperture 14 which overlies and is concentric with the playfield 2. For convenience the wall mounting plate 13 has been omitted from Figure 1. The aperture 14 in the wall mounting plate 13 has a diameter less than that of the table 1 so that the wall mounting plate 13 overlies the marginal circumferential edge of the playfield 2 and is spaced vertically therefrom so that substantially the whole of the playfield 2 is visible through the aperture 14.

The plate 13 provides a mounting for a wall 15 which extends around the major part length of the outer peripheral edge of the playfield 2. The wall 15 is formed by a spaced array of cylindrical rods 16 mounted with their axes vertical and their upper part lengths 17 slidably received in complementary bores 18 of the mounting plate 13. The bottom ends of the rods 16 abut the outer peripheral marginal edge of the playfield 2 so that during

rotation of the table 1 the playfield 2 slides beneath and in contact with the relatively stationary rods 16. The vertical displacement permitted for the rods 16 by their sliding movement within the bores 18 allows the rods to effectively float on the playfield 2 and thereby accommodate for undulations which may be present in the flat surface of the playfield or slight deviations of the playfield from its horizontal disposition during rotation.

Located at a gap in the wall 15 between a leading (with respect to rotation of the playfield) end 15a and a trailing end 15b thereof is a deposit region 19 over which are located two peripherally spaced tubular chutes 20 which extend upwardly from the playfield 2 and have their lower open ends overlying the marginal edge of the playfield. The chutes 20 are secured by brackets 21 relative to the mounting plate 13.

Located at the centre of the playfield 2 remote from the wall 15 is a rectangular aperture 22 which extends through the table 1 and communicates with an underlying chute 23 (Figure 2). The chute 23 is carried by the cabinet frame 10 and leads from the aperture 22 downwardly to a collecting tray or trough 24.

The game machine is played with flat faced coins C or similar playing pieces such as tokens (which in Figure 1 are shown as being circular although playing pieces with a non-circular profile can be used) and the width of the playfield from the periphery of its central aperture 22 to the adjacent wall 15 is several times greater than the width or diameter of a coin C for which the machine is intended. In a typical example, a game machine intended for use with coins of 3 centimetres diameter will have a playfield of approximately 56 centimetres diameter and a central aperture approximately 15 centrimetres squar . In

use of the machine the table 1 is likely to be rotating continuously at relatively low speed, say 8 to 15 rpm in the direction of arrow A and coins C are dropped successively through the tubular chutes 20 where they fall flat onto the rotating playfield in the deposit region 19. A coin thus deposited is carried by the playfield to abut the rods 16 at the leading end 15a of the wall 15 and thereafter to move along and follow the wall 15 in abutment with the rods 16 as the playfield continues its rotation. The floating abutment of the bottom ends of the rods 16 with the playfield alleviates the possibility of coins from passing off the playfield beneath the rods. A particular feature of the machine is that the wall 15 is profiled over the playfield to approach the central aperture 22 as the wall progresses from its leading end 15a to its trailing end 15b. In the example shown in Figure 1 the wall 15 is of helical or spiral form about the axis 4 so that the leading end 15a of the wall is spaced further from the axis 4 than is the trailing end 15b. Consequently as a coin is moved along the wall 15 by the rotating playfield 2 it is displaced radially inwardly over the playfield towards the aperture 22. When a coin is carried by the playfield from the trailing end 15b of the wall following its first rotation on the playfield, it is preferred that the coin is displaced radially inwardly sufficiently to clear the deposit region 19 so that additional coins dropping down the chute 20 can fall unimpeded flat onto the playfield 2.

When sufficient coins have been deposited on the playfield 2 it will be appreciated that as further coins are added at the deposit region 19 and moved into abutment with the wall 15, coins on the playfield can abut each other to be displaced radially inwardly over the rotating playfield towards the aperture 22. Eventually sufficient

coins will be deposited on the playfield and appropriately (but randomly) disposed for one or more, winning coins, to fall over the edge of the aperture 22 and be carried by the chute 23 into the trough 24 which will be accessible by the player for collection. In the typical example mentioned, it is likely that 300 to 500 coins will be disposed over the playfield for winning coins to result.

Formed in the wall 15 remote from the deposit region 19 is a second peripheral gap 30 (see Figure 2) through which the playfield communicates with a slotted aperture 31 in the flange plate 12. The slot 31 communicates with an underlying collection tray 32 which is inaccessible to the player. As the coins C are carried by the rotating playfield 2 and move along the wall 15 some coins can pass through the gap 30 and be displaced to fall off the playfield and through the slotted aperture 31 into the collection tray 32 - these are loss coins. Rods 16a mounted similarly to the rods 16 can be provided to form an extension from the wall 15 for guiding loss coins to the aperture 31. The size and formation of the gap 30 in the wall 15 will usually be determined so that the proportion of coins which pass through the gap 30 and are lost to the player will provide the proprietor of the machine with a profit which is considered appropriate.

In the modification shown in Figure 3 the playfield 2 is provided with risers which locally disrupt the profile of the playfield and can cause coins which are being displaced towards the central aperture 22 to climb over each other and double-up or form a stack of coins on the playfield. In Figure 3 one such riser is provided by a domed head of a screw 40 in the table 1. Another riser is provided by a ramp 41 on the marginal peripheral edge of the playfield adjacent to the aperture 22. The ramp 41

may cause a stack of coins C to develop on the playfield and overhang the aperture 22 in a manner which is particularly appealing to attract players.

Where coins overhang the aperture 22 in an apparently precarious manner it is possible a player will try to vibrate or bang the machine in an attempt to dislodge coins from the playfield for collection in the trough 24. To alleviate mis-use of the machine in this way vibration sensors 49 can be provided in the machine which serve to actuate a control unit 50 conveniently mounted on the chute 23. In response to the detectors 49 sensing unauthorised vibration, the control unit 50 reacts to open a flap or panel 51 (conveniently by hinged or sliding movement of the panel) in the bottom wall of the chute so that believedly winning coins falling down the chute 23 are diverted and directed into a collection tray 52 which is inaccessible to the player. The tray 52 may be common with the tray 32. The control unit 50 will likely have a timer so that that panel 51 closes automatically a predetermined interval after the vibration has been sensed.

It will be appreciated that the playfield 2 may be heavily loaded with randomly disposed coins and this loading can tend to displace the playfield from its horizontal disposition during rotation. To alleviate this it is preferred that the table 1 can rotate while supported on bearings. Such bearings are conveniently provided by pads 60 of low friction material (such as PTFE) which are carried by the flange plate 12 to underlie and, normally, to be slightly spaced from the bottom surface 7 at the peripheral edge of the platform 1.

CLAIMS

1. A game machine comprising a substantially horizontal playfield rotatable about a substantially vertical axis and drive means for effecting such rotation; wall means extending along an outer peripheral region of the playfield and relative to which the playfield rotates; means for depositing playing pieces at a deposit region on the playfield so that said playing pieces are carried by the rotating playfield to move along the wall means in abutment therewith; an apertured region in the playfield remote from said wall means and through which playing pieces can fall for collection, and wherein said wall means is arranged to displace playing pieces over the playfield progressively towards said apertured region as playing pieces move along the wall means.

2. A machine as claimed in claim 1 in which the wall means extends around the periphery of the playfield for a length less than that corresponding to one revolution of the playfield.

3. A machine as claimed in either claim 1 or claim 2 in which the wall means has a helical or spiral profile with respect to the rotational axis of the playfield.

4. A machine as claimed in any one of the preceding claims in which the deposit region is located in an opening in the wall means peripherally between a leading end and a trailing end thereof for playing pieces deposited in said region to be carried by the rotating playfield into abutment with the leading end of the wall means.

5. A machine as claimed in any one of the preceding claims in which playing pieces deposited at the deposit region are displaced by the wall means towards said apertured region during one revolution of the playing pieces on the playfield from the deposit region by an

amount not less than that substantially corresponding to the width/diameter of a said playing piece.

6. A machine as claimed in any one of the preceding claims in which the playfield has a minimum width from the wall means to the apertured region which can accommodate a plurality of widths/diameters of a playing piece for which the game machine is intended.

7. A machine as claimed in any one of the preceding claims in which the apertured region comprises a single aperture located substantially at the centre of the playfield.

8. A machine as claimed in claim 7 in which the aperture is substantially rectangular.

9. A machine as claimed in any one of claims 1 to 6 in which the apertured region comprises at least two apertures in the playfield.

10. A machine as claimed in any one of the preceding claims in which the apertured region communicates with an underlying chute for delivery of playing pieces falling therethrough to a collection station.

11. A machine as claimed in any one of the preceding claims in which the wall means extends downwardly to slidably abut the playfield for alleviating playing pieces from passing over the playfield and beneath the wall means.

12. A machine as claimed in claim 11 in which the wall means is displaceable to float on the playfield in its abutment therewith for accommodating undulations in the surface of the playfield and in the horizontal disposition of the playfield during its rotation.

13. A machine as claimed in any one of the preceding claims in which the wall means comprises an array of upstanding pegs or rods.

14. A machine as claimed in claim 13 when appendant to

claim 12 in which upper part lengths of the pegs or rods are slidably received in bores of a support member and lower ends of the pegs or rods slidingly abut the playfield for the pegs or rods to be displaceable relative to the support member and in response to undulations in the playfield and in the horizontal disposition of the playfield during its rotation.

15. A machine as claimed in any one of the preceding claims in which an outlet is provided from the playfield separate from the apertured region and through which outlet a proportion of playing pieces deposited on the playfield and displaced relative thereto can pass from the playfield for collection separately from such playing pieces as fall through the apertured region.

16. A machine as claimed in claim 15 in which the outlet comprises an, or a second, opening in the wall means through which said proportion of playing pieces is displaced from the playfield for collection.

17. A machine as claimed in either claim 15 or claim 16 in which the outlet comprises a second apertured region in the playfield remote from the wall means.

18. A machine as claimed in any one of the preceding claims and comprising a playing piece chute through which successive playing pieces can be fed to the deposit region.

19. A machine as claimed in any one of the preceding claims in which the playfield is provided with riser means which presents an undulation in its surface and over which playing pieces can be displaced to ride one over another for developing a stack of playing pieces on the playfield.

20. A machine as claimed in claim 19 in which the riser means comprises a ramp located at a peripheral edge of the playfield adjacent to the apertured region so that a stack of playing pieces can develop to overhang the apertured

region.

21. A machine as claimed in any one of the preceding claims and having vibration sensitive means which reacts in response to unauthorised vibration or banging of the machine and responds to divert playing pieces falling through the, or the first, apertured region from their passage to a first collection station and directs them to a second collection station.

22. A machine as claimed in claim 21 when appendant to claim 10 in which the vibration sensitive means comprises displaceable means associated with the chute and which is displaced in response to said vibration or banging of the machine from a first position in which the playing pieces falling through the apertured region pass to the first collection station to a second position in which said playing pieces pass to the second collection station.

23. A machine as claimed in either claim 21 or claim 22 in which the vibration sensitive means includes a timer which after a predetermined interval following vibration or banging of the machine automatically re-sets the vibration sensitive means to direct playing pieces falling through the apertured region to the first collection station.

24. A machine as claimed in any one of the preceding claims in which the playfield is carried by a table rotatably mounted on bearing means.

25. A machine as claimed in any one of the preceding claims in which the drive means comprises a substantially vertical drive shaft co-axial with and coupled to the platform.

26. A machine as claimed in claim 25 in which the playfield is located on a or the table and said table is carried by the drive shaft.

27. A game machine substantially as herein described with

reference to the accompanying illustrative drawings.

Patents Act 1977
Examiner's report to the Comptroller under section 17 (The Search Report)

Application number
9102906.6

Relevant Technical fields

(i) UK Cl (Edition K) A6H (H10X19)

(ii) Int Cl (Edition 5) A63F 7/38

Search Examiner
A T BLUNT

Databases (see over)

(i) UK Patent Office

(ii)

Date of Search
4 APRIL 1991

Documents considered relevant following a search in respect of claims 1-27

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
A	US 4,133,525 (BALLES)	1

Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

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